Technical & Utility Realities

What are the "real" issues around technology in utilities?

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PNM Resources

Outline for today

- Introduction
- Concepts for our conversations
- Technology Trends
- Building the grid system of yesterday, TODAY!
- Reasons/Excuses for doing nothing
- Call to action

Did you know?

- PNM's electric rates have gone down since 1985. Inflation adjusted, a 44% decrease.
- Average annual electric bills in NM for PNM customers are the 2nd lowest in the nation today.
- In 2001, PNM was rated #1 in EEI's reliability survey. In the top 10 for the last 5 years.
- PNM's customer service and call center was rated #1 in 2003.

Concepts for our Conversations

- Common Sense is a terrible thing to have and not use.
- You have to draw a line in the sand at some point in time and begin this process. Set the standard for new installations and then work backward into legacy.
- Don't forget the human factor.
- You can't fix it all it at once. Prioritize so you can continually focus on your TOP 5 (or 2 or 10).
- You will not "find the magic bullet" in this, or any other, presentation you see. It's about vision embodied in patience, passion and perseverance to 'make it better than where you found it'.

Technology Trends

- Technology ‘Creation’ Rates are increasing exponentially.
- Technology adoption rates (or application) are actually declining in the United States. Data, Information & Technology Overload!
- Technology ‘fear’ is at an all time high.
- Drives a culture of ‘do nothing’
- Need a culture of ‘application’ short-term
- Need a culture of ‘acceptance’ and ‘change’ long-term

Technology Trends

Over a million ~~*reasons*~~ excuses NOT to implement technology

- Leading Edge or Bleeding Edge
- We've done it this way forever and it's still working
- I don't trust all of this new-fangled technology
- We're good enough
- We're a regulated monopoly so why do we care what anyone thinks
- We're OK with being last, let everyone else try first
- What if something new & better comes out next year?
- I've never heard of anyone being fired for doing it the same way, but I know people that have been fired for trying something new and different.

Transmission Tech – House of Cards??

- Superconductor Tech
  - Cable, Transformer, Fault Current Limiters, SMES, SuperVars, etc.
- Series Capacitors and Reactors
- Dynamic Stabilizers
- “Special Conductors”
- Grid Stability?
- “There’s no substitute for wires in the air.”
- More excuses cloaked in high tech terminology?

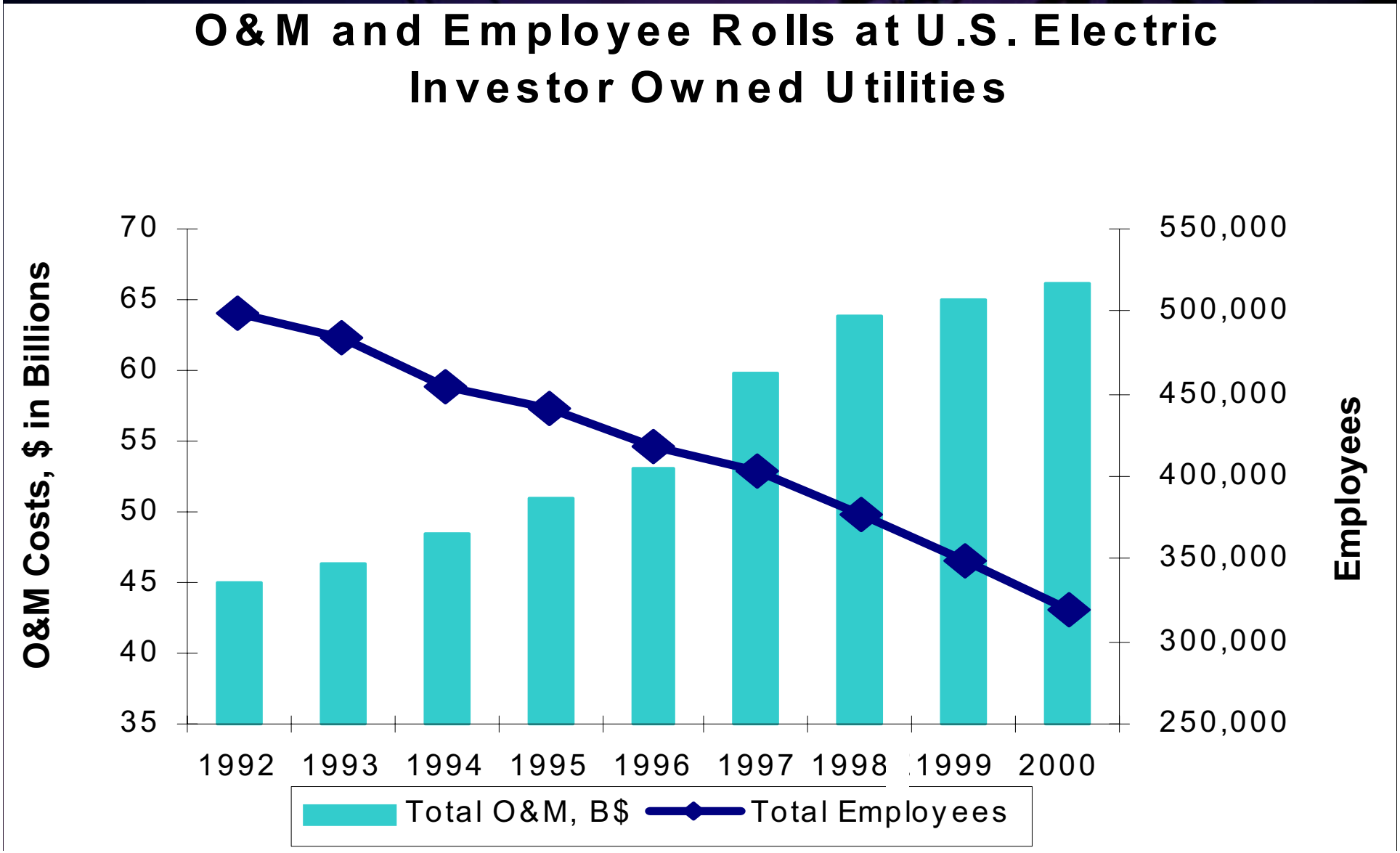
So, what's the real story?

- The transmission grids of the U.S. and the world are built primarily with early 1900's technology.
- Sporadic schemes of data acquisition, control and technical enhancements are sprinkled throughout our grid.
- Utilities are continue to specify and construct facilities the same way they were in the early 1900's.
- Significant, yet simple, technology improvements exist but are not being deployed.
- High tech is coming and core communication infrastructure will be the key to significant deployment over time

Why aren't these being used?

- Traveling Wave Fault Recorders
- Sequence of Event (SOE) and Disturbance Monitors
- Automated UFLS and UVLS schemes
- Standardized protection schemes including voting schemes for critical paths
- Functional Asset Management Systems
- DTCR models utilizing real-time weather

Is this a reason?



Is the uncertainty a reason?

- De-regulate, states you take care of it
- Some of you don't want to play, play anyway!
- No wait, Don't
- OK, how about re-regulate (Can you get that generation back?)
- No wait, let's set up a national framework
- OK, it's coming, we promise . . .

Do we have the perfect storm?

- Market & Regulatory Uncertainty. Why spend since I don't think I'll ever get it back?
- Aging Workforce unwilling to change
- Outsource it, we don't actually need to have anyone here that knows anything about our systems, right?
- Technophobes/Bean Counters running utilities
- NIMBY, BANANA, etc, etc, etc
- DG & Technology will save us

There are valid technical concerns that must be addressed

- Common Corridor Construction
- Increasing capacity on existing corridors
- System stability as we stretch our assets tighter and depend on fewer/larger assets.
- Outsmarting ourselves with cascading levels of technology
- Ignoring the ‘small things’ until they cascade into big things
- How will we maintain these new systems? Cryogenics, fiber optics, etc.

There are valid non-technical concerns that must be addressed

- What's my incentive to play?
- How can I structure my business to be successful when I don't know what the rules are or will be?
- Will I ever actually get to build something or am I going to spend the rest of my life in court?
- When is it 'good enough' or are we going to pour billions into the system for one more '9' of reliability for everyone?
- How do we protect this infrastructure???

Technology for the sake of Technology instead of for improved value?

- Will we be enamored with technology or really do an honest evaluation
  - Example – Parasitic losses associated with current super conducting technologies. Is the total owning cost even in the same ball park?
- Will we implement technology just to be doing SOMETHING instead of NOTHING


So, Where's the Leadership?
Industry
Federal
State
Regulatory

It's time for action

Someone has to step up to the plate.

Forums/Groups like this one must lead with a concrete vision inspired by passion and perseverance to help create greatly simplified and balanced legislation and regulatory rules to move the industry forward in a manner consistent with the critical nature of the service that we provide.

Questions or Comments?

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